

January 7, 1992

F/SWC2:RWB:JLB
CR9110-2.RWB

CRUISE REPORT

VESSEL: *Townsend Cromwell*, Cruise TC-91-10 (TC-168)

CRUISE PERIOD: November 20-December 19, 1991

AREA OF

OPERATION: Kona Coast, Island of Hawaii (Fig. 1)

TYPE OF

OPERATION: Personnel from the Honolulu (HL) and La Jolla (LJ) Laboratories, Southwest Fisheries Science Center (SWFSC), National Marine Fisheries Service (NMFS), NOAA; Woods Hole Oceanographic Institution; and Scripps Institute of Oceanography, University of California, San Diego were involved in a project to monitor the horizontal and vertical movements of striped marlin, *Tetrapturus audax*, using depth sensitive ultrasonic transmitters. Fish were initially captured using standard longline fishing techniques aboard the *Townsend Cromwell*. Fish were tracked by either the *Townsend Cromwell* or the research vessel *Kahele'ale* or both.

ITINERARY:

- 20 November Start of cruise. On board were Richard Brill (Chief Scientist), Frank Carey, Heidi Dewar, and Dave Holts. Departed Snug Harbor, Honolulu, Oahu, at 1400 and proceeded to area off Kona Coast, Island of Hawaii.
- 21-25 November Arrived area off Kona Coast. Conducted longline fishing operations to capture striped marlin. Obtained tracks from two striped marlin.
- 26 November Returned to Kailua-Kona to disembark Richard Brill, Frank Carey, Heidi Dewar, and Dave Holts and embark Randolph Chang and Scott Sullivan. Departed for Snug Harbor day earlier than originally planned in order to replace valve system in longline reel hydraulic motor.

- 27 November Arrived Snug Harbor.
- 30 November Departed Snug Harbor for Kailua-Kona. On board Randolph Chang, Dan Curran, and Scott Sullivan.
- 1 December Arrived Kailua-Kona. Tied up to pier and held open house. Disembarked Randolph Chang and Scott Sullivan. Embarked Richard Brill, Heidi Dewar, and Dave Holts.
- 2-18 December Conducted longline fishing operations for striped marlin. Obtained tracks from four striped marlin. (11 December exchanged Heidi Dewar for Leslie Timme at Kailua-Kona.)
- 18 December Departed area off Kona Coast for Snug Harbor.
- 19 December Arrived at Snug Harbor at 0500. End of cruise.

MISSION AND RESULTS:

Characterize horizontal and vertical movements of striped marlin using ultrasonic depth sensitive transmitters and relate these movements to XBT data and all other oceanographic information simultaneously obtained during tracking operations.

Six striped marlin were captured and released after attachment of ultrasonic depth sensitive transmitters. One fish died approximately 5 hr after release. Another fish was followed for approximately 11 hr, two fish for approximately 24 hr, and two fish for approximately 48 hr.

The horizontal movements of all of the fish but one appeared to be determined by currents. They exhibited a very slow speed through the water with little or no obvious directionality; however, they had very high speed over ground and marked directionality because of currents. The one fish that did not fit this pattern appeared to wander randomly in a relatively small area and was within approximately 3 nmi of the point of capture after 51 hr of tracking. The movements of this fish occurred in spite of the presence of 1-2 kn northward current.

All of the fish spent the majority of the observation periods in the upper mixed layer (i.e., shallower than approximately 100 m), and their vertical movements appeared to be highly constrained by water temperature. Maximum depth appeared to be constrained by the depth of the 20°C isotherm, and the fish rarely ventured into depths with lower water temperatures.

RECORDS:

The following forms, logs, and data records were kept and turned in to the Honolulu Laboratory upon termination of the cruise.

Marine operations long
Occurrence of birds, aquatic mammals, and fish school logs
Pacific dolphin project marine mammal sighting form
Weather logs
VAX data tapes
Acoustic Doppler current profiler data (Bernoulli cartridges)

SCIENTIFIC PERSONNEL:

Richard Brill, Chief Scientist, National Marine Fisheries Service
(NMFS), Southwest Fisheries Science Center (SWFSC), Honolulu
Laboratory (HL)

Frank Carey, Cooperative Scientist, Woods Hole Oceanographic
Institution

Daniel Curran, Research Assistant, NMFS, SWFSC, HL

Heidi Dewar, Cooperative Scientist, Scripps Institute of Oceano-
graphy, University of California, San Diego

Dave Holts, Fishery Biologist, NMFS, SWFSC, La Jolla Laboratory
(LJ)

Leslie Timme, Research Assistant, NMFS, SWFSC, HL

Submitted by:

Richard W. Brill
Chief Scientist

Approved by:

George W. Boehlert
Director, Honolulu Laboratory

Attachment